

## CLAIMS

**What is claimed is:**

- 5 1. A method of monitoring the performance of an automatic capture verification feature in a cardiac stimulation device, the method comprising:
- 10 monitoring the number of backup stimulation pulses delivered, and storing the number of backup stimulation pulses delivered;
- 15 monitoring the number of primary stimulation pulses delivered at each of a plurality of stimulation output settings, and storing the number of primary stimulation pulses at the respective output settings; and
- 20 comparing the stored number of backup stimulation pulses to the stored number of primary stimulation pulses to evaluate the performance of the automatic capture verification feature.
- 25 2. The method of claim 1, further comprising the step of selecting a stimulation pulse output setting based on the historical frequency of occurrence of the primary stimulation pulses and the backup stimulation pulses.
- 30 3. The method of claim 2, wherein the step of storing the number of backup stimulation pulses comprises storing the number of the backup stimulation pulses in a first histogram bin assigned to a high-energy output setting.
4. The method of claim 3, wherein the step of storing the number of primary stimulation pulses comprises storing the number of the primary stimulation pulses in a second histogram bin.

5. The method of claim 4, further comprising graphically displaying the first histogram and the second histogram.

5 6. The method of claim 1, further comprising the step of determining an expected remaining life of a power source based on a historical frequency of occurrence of the primary stimulation pulses and the backup stimulation pulses.

10 7. The method of claim 1, further comprising the step of evaluating the integrity of the stimulation device based on a historical frequency of occurrence of the primary stimulation pulses and the backup stimulation pulses.

15 8. The method of claim 1, wherein the step of storing the number of backup stimulation pulses comprises the step of storing the number of backup stimulation pulses delivered to each cardiac chamber.

20 9. The method of claim 8, wherein the step of storing the number of backup stimulation pulses comprises the step of storing the number of backup stimulation pulses delivered to each stimulation site.

25 10. The method of claim 9, wherein the step of storing the number of backup stimulation pulses comprises the step of storing the number of backup stimulation pulses delivered to each stimulation site in at least one cardiac chamber.

11. A stimulation device that monitors the performance of an automatic capture verification feature, comprising:

a pulse generator that selectively generates backup stimulation pulses and primary stimulation pulses;

5 a memory that stores the number of backup stimulation pulses and stores the number of primary stimulation pulses delivered at each of a plurality of stimulation output settings;

a counter that increments the stored number of backup stimulation pulses stored in the memory, wherein the counter  
10 further increments the stored number of primary stimulation pulses when a primary stimulation pulse is delivered at a given output setting; and

a controller that is operative to compare the stored number of backup stimulation pulses to the stored number of primary  
15 stimulation pulses to allow for an evaluation of the performance of the automatic capture verification feature.

12. The stimulation device of claim 11, wherein the first memory stores the number of occurrences of the backup stimulation pulses in a  
20 histogram bin assigned to a high-energy output setting.

13. The stimulation device of claim 12, wherein the counter increments the histogram bin each time a backup stimulation pulse is delivered at the high-energy output setting in response to loss of capture.  
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14. The stimulation device of claim 13, wherein the second memory stores the number of occurrences of the primary stimulation pulses in a plurality of histogram bins each assigned to a stimulation output setting.

30 15. The stimulation device of claim 14, wherein the second memory stores the number of the primary stimulation pulses in a plurality of histogram bins each assigned to a range of stimulation output settings.

16. The stimulation device of claim 11, wherein the counter stores the number of the primary stimulation pulses in one of the plurality of histogram bins, each time a primary stimulation pulse is delivered at the given output setting.

17. The stimulation device of claim 11, wherein the first memory stores, in a first histogram, the number of backup stimulation pulses delivered to each stimulated cardiac chamber.

18. The stimulation device of claim 17, wherein the second memory stores, in a second histogram, the number of primary stimulation pulses delivered at the plurality of stimulation output settings delivered to each stimulated cardiac chamber.

19. A stimulation device that monitors the performance of an automatic capture verification feature, comprising:

- means for storing a number of backup stimulation pulses delivered by the device;
- means for incrementing the stored number of backup stimulation pulses delivered;
- means for storing a number of primary stimulation pulses delivered at each of a plurality of stimulation output settings;
- means for incrementing the stored number of primary stimulation pulses at the respective output settings; and
- means for comparing the stored number of backup stimulation pulses to the stored number of primary stimulation pulses to evaluate the performance of the automatic capture verification feature.

20. The stimulation device of claim 19, wherein the first memory means stores the number of occurrences of the backup stimulation pulses in a histogram bin assigned to a high-energy output setting.

5 21. The stimulation device of claim 20, wherein the incrementing means increments the histogram bin each time a backup stimulation pulse is delivered at the high-energy output setting in response to loss of capture.

10 22. The stimulation device of claim 21, wherein the second memory means stores the number of occurrences of the primary stimulation pulses in a plurality of histogram bins each assigned to a stimulation output setting.

15 23. The stimulation device of claim 22, wherein the second memory means stores the number of the primary stimulation pulses in a plurality of histogram bins each assigned to a range of stimulation output settings.

20 24. The stimulation device of claim 23, wherein the incrementing means stores the number of the primary stimulation pulses in one of the plurality of histogram bins, each time a primary stimulation pulse is delivered at the given output setting.

25 25. The stimulation device of claim 19, wherein the first memory means stores, in a first histogram, the number of backup stimulation pulses delivered to each stimulated cardiac chamber.

30 26. The stimulation device of claim 25, wherein the second memory means stores, in a second histogram, the number of primary stimulation pulses delivered at the plurality of stimulation output settings delivered to each stimulated cardiac chamber.